Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID W. BIRCH, ANDRE MICKE,
SHUEN-CHENG HWANG, LESLI B. COSEY,
CARL W. SCHMIDT, DOWNERS GROVE,
ROBERT F. PHILLIPS and
D. BRUCE WILSON

Appeal No. 2000-1300
Application No. 08/853,581

ON BRIEF

Before McCANDLISH, Senior Administrative Patent Judge and FRANKFORT and STAAB, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

## DECISION ON APPEAL

This is a decision on appeal from the examiner's refusal to allow claims 1, 4, 7 through 14 and 17 through 19 as amended subsequent to the final rejection in a paper filed on July 30, 1999 (Paper No. 10). Claims 1, 4, 7 through 14 and 17 through

19 are all of the claims remaining in this application. Claims 2, 3, 5, 6, 15, 16 and 20 have been canceled.

As noted on page 1 of the specification, appellants' invention relates to:

> a method of producing flowing gas mixtures having constant compositions over periods of time, and more particularly to a method of providing a gas mixture stream whose component concentrations are continuously adjusted to maintain the ratio of the components of the gas mixture substantially constant over extended periods of time. The invention is especially useful for accurately filling gas cylinders with gas mixtures of desired compositions.

In addition, the invention also relates to a system (claim 13) for carrying out the above method.

Independent claims 1 and 13 are representative of the subject matter on appeal and a copy of those claims can be found in the Appendix to appellants' brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

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| Strain et al. (Strain) | 3,856,033 | Dec. 24, 1974 |
| McLoughlin et al. (McLoughlin) | 4,324,294 | Apr. 13, 1982 |

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| Azimov | 4,799,511 | Jan. 24, 1989 |
| Chapman | 5,674,382 | Oct. 7, 1997 |
| | (filed Jan. 11, 1996) | |

Claims 1, 7, 8, 12, 13 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chapman in view of McLoughlin.

Claims 4 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chapman in view of McLoughlin as applied above, and further in view of Azimov.

Claims 9 through 11, 14 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chapman in view of McLoughlin as applied above, and further in view of Strain.

Rather than reiterate the examiner's full statement of the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding those rejections, we make reference to the final rejection (Paper No. 7, mailed February 9, 1999) and the examiner's supplemental answer (Paper

No. 17, mailed March 2, 2001) for the examiner's reasoning in support of the rejections, and to appellants' brief (Paper No. 14, filed September 20, 1999) for the arguments thereagainst.

## OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions

articulated by appellants and the examiner. As a consequence of our review, we have made the determinations which follow.

Looking to the examiner's rejection of claims 1, 7, 8, 12, 13 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Chapman in view of McLoughlin, we note that the examiner is of the view (final rejection, page 3) that it would have been obvious to one of ordinary skill in the art "to replace the Chapman pumps and mixing valve with variable pumps to eliminate the Chapman mixing valve and because McLoughlin teaches the equivalence of the two arrangements." Further insight into the examiner's position is provided in the supplemental answer, page 5, where it is indicated that:

> It is the examiner's position that one of ordinary skill in the automatic fluid ratio control art would view both references and realize that application of McLoughlin's Fig. 1 system would allow him to improve Chapman by eliminating the distinct mixing valve 32 and instead use only variable speed pumps to control fluid ratios. This step would clearly simplify Chapman. While there is no direct teaching of controlling ratios of gas by controlling liquid pumps the substitution of variable speed pumps in Chapman would inherently result in such a system because the Chapman pumps are pumping liquid. The fact that the reason for using variable speed pumps in the Chapman liquid lines is not the same reason that appellant would do so is irrelevant. It is only sufficient that a good reason (as seen by one of ordinary skill) exist either in the references themselves or good engineering practice. In this case good engineering

> practice, simplification of Chapman by the elimination of a separate complex mixing valve, provides sufficient reason.

Chapman addresses a wet oxidation system for treatment of waste water. In such a system large amounts of oxygen or oxygen containing gas are introduced into waste water before the waste water is introduced into a high temperature reactor (18) in which oxidation takes place at elevated temperatures. In its basic form (Figure 1) the system in Chapman includes a liquid oxygen storage tank (22), a high pressure pump (26) for pumping said liquid oxygen thereby raising its pressure, an evaporator (28) for evaporating said liquid oxygen, nitrogen supply means (20, 24, 30) for supplying nitrogen, a first mixer (32) for mixing the evaporated oxygen and nitrogen, and a second mixer (16) for mixing the oxygen/nitrogen mix with waste water to be treated in the reactor (18). Downstream of the first mixer (32), the oxygen content of the gas mixture is measured by an oxygen monitor (36) and a feedback control (38) adjusts the mixing of the gas components (in mixer 32) to correct any deviation of the actual composition of the gas mixture from the desired composition of the gas mixture.

McLoughlin relates to a chemical injection control system

for use in fire fighting, wherein foam or other type chemicals are added to the water used for fighting a fire. In Figure 1, chemicals from tank (12) are added to the water passing through pump (P) based on the flow measured at output hoses (3, 4, 5) providing a feedback to amplifier (6) and potentiometer (8). The potentiometer is set to a desired ratio between the chemicals and total flow. A signal proportional to total flow is connected to the potentiometer (8), the output of which is connected to amplifier (9). The output of amplifier (9) is connected to electric motor (10) which operates a pump (11) that pumps foam or other chemicals from the tank (12) to the pump (P). As noted in column 2, lines 18-21, by setting the desired ratio on the potentiometer (8) the desired ratio will be maintained by the amplifier (9) controlling the speed of the electric motor (10), which in turn controls the chemical pump (11). An alternative embodiment is seen in Figure 2 of McLoughlin. In the alternative embodiment, instead of controlling an electric motor and pump as in Fig. 1, the servo amplifier (9’) controls a motor (22) which controls a valve (13), and it is the valve (13) which controls the ratio of chemicals to total flow.

As observed by appellants (brief, page 4), the arrangement in Chapman is generally the type of system over which the claimed invention is an improvement, since a system like that of Chapman produces less than satisfactory results because it is difficult or impossible to accurately adjust the flow rate of gases at high pressures (e.g., at 32 therein) to provide a gas mixture of the desired composition, due to the compressibility of the gases.

Further, like appellants, we consider that Chapman and McLoughlin belong to completely disparate technologies and that one seeking to solve a problem in the area of mixing high pressure gases to attain a desired composition of gases, as in Chapman and the present application, would not have been inclined to look to the art of mixing foam or other fire fighting chemicals with a water stream used in fighting fires. In this regard, we also share appellants' view that there is no disclosure whatsoever in McLoughlin of analyzing a mixture (whether it be a gas mixture or a liquid mixture) and then adjusting the flow rate of a liquid in response to the analysis to correct a deviation of the concentration of the mixture from a desired concentration. McLoughlin uses total flow rate to

control the pump (11) or valve (13) and thus the amount of foam or other chemicals added to the water stream.

In our opinion, in searching for an incentive for modifying the gas mixing apparatus of Chapman, the examiner has impermissibly drawn from appellants' own teachings regarding the deficiencies of the prior art. In this regard, it is clear that the examiner has fallen victim to what our reviewing Court has called "the insidious effect of a hindsight syndrome wherein that which only the inventor has taught is used against its teacher." W. L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983). Since it is our determination that the teachings and suggestions found in Chapman and McLoughlin would not have made the subject matter as a whole of independent claims 1 and 13 on appeal obvious to one of ordinary skill in the art at the time of appellants' invention, we must refuse to sustain the examiner's rejection of those claims under 35 U.S.C. § 103(a). It follows that the examiner's rejection of dependent claims 7, 8, 12 and 19 under 35 U.S.C. § 103(a) based on Chapman and McLoughlin will also not be sustained.

Regarding the examiner's rejection of dependent claims 4 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Chapman, McLoughlin and Azimov, and the rejection of claims 9 through 11, 14 and 17 under 35 U.S.C. § 103(a) based on Chapman, McLoughlin and Strain, we have reviewed the references to Azimov and Strain, but find nothing therein which overcomes or provides for the deficiencies we have identified above with regard to the basic combination of Chapman and McLoughlin. Accordingly, the examiner's rejections of dependent claims 4, 9 through 11, 14, 17 and 18 under 35 U.S.C. § 103(a) will likewise not be sustained.

In light of the foregoing, the decision of the examiner to reject claims 1, 4, 7 through 14 and 17 through 19 under 35 U.S.C. § 103(a) is reversed.

REVERSED

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| HARRISON E. McCANDLISH<br>Senior Administrative Patent Judge | ) | |
| CHARLES E. FRANKFORT<br>Administrative Patent Judge | ) | BOARD OF PATENT<br>APPEALS AND<br>INTERFERENCES |
| LAWRENCE J. STAAB<br>Administrative Patent Judge | ) | |

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